EXECUTIVE SUMMARY

Continued airworthiness assessment of existing repairs was identified as a significant concern by the Airworthiness Assurance Task Force (now known as the Airworthiness Assurance Working Group (AAWG)) in June 1988. The industry, with the cooperation of the regulatory agencies, has been in continuous review of the issues surrounding continued airworthiness of structural repairs since that time. This report documents the findings of the AAWG on this issue.

This report advocates that a one time structural repair assessment task for the external fuselage pressure boundary [fuselage skins and bulkhead webs] for continued airworthiness be added to the normal maintenance program for the Airbus A - 300; BAC 1 - 11; Boeing 707/720, 727, 737, 747; Douglas DC - 8, DC - 9/MD - 80, DC - 10; Fokker F-28; and the Lockheed L - 1011. The purpose of the assessment is to establish appropriate maintenance programs for certain repairs to ensure their continued airworthiness. The repair assessment guidelines detailed by this report is supported by OEM supplied model specific repair assessment documents, structural repair manual updates, and detailed training programs.

The report also advocates that while existing FAA regulations are sufficient to ensure compliance with the proposed repair assessment guidelines, this program be mandated by rule changes to 14 CFR Parts 43, 91, 121, 125, and 129. The proposed rule also specifies model specific implementation times for when individual aircraft are to be included in the assessment process. In addition, the rule changes are supported by a proposed Advisory Circular that provides information on program implementation.

These recommendations are supported by an extensive assessment of 1051 structural repairs installed on 65 airplanes of the types listed above.

In examining the issue of the continued airworthiness of structural repairs, the AAWG reached six conclusions and six recommendations.

CONCLUSIONS

As a result of the studies carried out on existing in-service repairs by the AAWG, the following conclusions were reached:

- The industry as a whole lacks sufficient information and training to evaluate previous installed repairs for continued airworthiness.
- Some existing repairs may require supplemental inspections to maintain structural airworthiness.

- Sufficient operational rules exist to enforce inspection programs on repairs for structural integrity but may not be sufficient to highlight the concern and necessary action to be taken.
- Data from surveys of repairs indicates no immediate airworthiness concern for previously installed repairs.
- Fuselage pressure boundary repairs represent the most significant concern to safety.
- Airline maintenance programs are focused to identify questionable repairs and replace them.

RECOMMENDATIONS

Based on the conclusions of this report and with respect to the external fuselage pressure boundary [fuselage skins and bulkhead webs] it is recommended:

- That the Federal Aviation Administration (FAA) consider a rule change to 14 CFR 91, 121, 125, and 129 be promulgated to ensure that an assessment for continued airworthiness for structural repairs on the fuselage pressure boundary of the Airbus A - 300; BAC 1 - 11; Boeing 707/720, 727, 737, 747; Douglas DC - 8, DC - 9/MD - 80, DC - 10; Fokker F-28; and the Lockheed L - 1011 be accomplished. The suggested wording of these new rules is contained in Section 7 of this report.
- That the FAA consider an Advisory Circular to provide guidance on rule accomplishment. The suggested wording of this Advisory Circular is contained in Section 8 of this report.
- That the Original Equipment Manufacturer (OEM) provide sufficient published data in the SRM, supported by model specific repair assessment guidelines material, to enable the operator to assess existing and proposed repairs.
- That the FAA require Supplemental Type Certificate Applicants to evaluate the effect of repairs in the vicinity of the planned structural modification for potential impact to continued airworthiness.
- That the Transport Aircraft and Engine Issue Group (TAEIG) recommend that the issues discussed in this report become the subject of an international harmonization task.
- That the OEMs provide repair assessment briefings and training to operator maintenance and engineering personnel and regulatory agencies within one year of initial publication of model specific repair assessment procedures.